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ABSTRACT

Due to the increasing emphasis on technology and the trend toward downsizing and multiculturalism in today's workplace, graduates of technical education programs need non-technical thinking and problem solving skills to stay successfully employed. Historically, however, a dichotomy has existed between vocational and liberal education, which has limited the technical education curriculum to imparting specific job skills. In order to best fulfill employer and employee needs, a new curriculum design is needed which utilizes both sociological and systems theory perspectives to understand the interplay between the curriculum and society. This new curriculum should take into account the desired technical and non-technical student outcomes and fuse liberal arts with technical education in the limited associate degree time-frame. In a model approach, faculty should first develop a general education core designed to improve students' creative and critical thinking, communication skills, and understanding of the world around them. The technical curriculum should then be constructed to further improve student problem solving and interpersonal skills and to develop a proficiency in their technical field. Finally, the two parts should be integrated into a student-centered, outcomes-based system designed to address declarative and procedural knowledge within an applied context and enable students to develop the physical and conceptual tools necessary to link them. (Contains 14 references.) (MAB)

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SHOULD TECHNICAL EDUCATION BE MORE LIBERAL?

BY

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AMERICAN TECHNICAL EDUCATION ASSOCIATION

30th NATIONAL CONFERENCE ON TECHNICAL EDUCATION
March 19, 1993

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I. INTRODUCTION

The theme of this conference is "Technical Education in the Global Marketplace." Today, I want to explore this theme with you from the perspective of the curriculum. The title of this session is "Should Technical Education be More Liberal?" At the conclusion of the presentation, you may or may not be able to answer for yourself the question posed. However, I do hope that by the end of the presentation, I will have caused you to think about the question and to have perhaps influenced your thinking.

Today, as I attempt to answer the question posed, i.e., should technical education be more liberal, I will explore the technical education curriculum from two perspectives--sociology and systems theory. I am indebted to four individuals who have helped, through their writing and teaching, to focus my thinking: French philosopher and educator Jacques Maritain, English philosopher and educator Alfred North Whitehead, systems scientist, physicist, and educator extraordinaire John A. Dillon Jr., and sociologist and educator Gladys M. Busch. I will tell you a little about these individuals later in the presentation.

I believe it is necessary for us, as educators, to view the curriculum from both a sociological perspective, particularly in terms of

social structures, and from a systems theory perspective. The workplace, the place for which we claim we are preparing people, is an integral part of our social structure. It is not a stand alone entity that does not interact with other parts of our society or our culture. The workplace is a part of a dynamic social system. The curriculum is a system and a part of a system as we shall see in just a few moments.

Before we can begin to discuss in detail the curriculum and how it interacts with and supports our social structure, including that part referred to as the workplace, we need to briefly review some major trends that are occurring in the workplace. First, it is generally accepted that we are in a transitional period between an industrial society and an information society known as the post-industrial period. This post-industrial period is characterized by five major trends: (1) Technology, (2) downsizing, (3) an influx of women into the workforce, (4) the emergence of trans-national companies, and (5) multi-cultural communities.

Second, these major trends have substantial impact on the workplace and the kinds of skills and knowledge employers seek in prospective employees. Unfortunately, changes in employee skills are not keeping pace with the changing needs of employers (Parnell, 1990).

What are the kinds of skills and knowledge needed by employees today to ensure that they can obtain and keep rewarding work. In Workplace Basics, Carnevale et al. (1990) outlined and discussed seven broad categories. These are not new to anyone in this room, but a quick review is in order.

1. The Foundation: Learning to Learn.

2. Basic Academic Skill Competence: Reading, Writing, Computation.

3. Communication Skills: Oral and Listening.

4. Adaptability: Creative Thinking and Problem Solving.

5. Personal Management: Self-Esteem, Motivation/Goal Setting, Employability/Career Development.

6. Group Effectiveness: Interpersonal Skills, Negotiation, and Teamwork.

7. Influence: Organizational Effectiveness and Leadership.

I think that we would all agree that America's workforce is key to successful competition in the global marketplace, and that as technical educators we play a major role in developing that workforce. I submit that educating that workforce requires an innovative approach to curriculum development and delivery, one designed to better meet the needs of students studying in technical fields and the needs of employers hiring graduates of technical education programs. The approach needed is one that considers changes in our society and culture and one that is founded in the basic principles of systems theory.

Faculty in the two year technical college as well as the employing community are experiencing the phenomenon of the growing mismatch between the quality of the workforce and the requirements of the new jobs that are being created in communities through changing technology and aggressive economic development. In order for our faculty to continue to be responsive to the needs of business and industry, to the needs of society, and to the needs of students, it is clear that the curriculum in the technical college needs to be re-examined. In terms of designing and delivering associate degree level technical education, a

new paradigm is needed. The curriculum must be constructed in a way which supports the faculty in their efforts to help provide students the kinds of skills and knowledge needed for successful employment opportunities.

Assuming all this is true, the question faculty face then is one of how is the gap bridged How does one prepare workers who can think, synthesize, problem solve, make judgments, communicate effectively, and who have a sense of purpose. More specifically, what can a two-year degree program realistically accomplish, particularly in light of the wide variety of personal and academic backgrounds that students of the two-year technical college bring to campus. It is my premise that one way this challenge can be addressed is through responding positively to the question posed at the beginning of this presentation, that is, technical education should be more liberal.

To ensure that we are working from the same set of rules, please allow me to set some definitions. I am speaking today specifically about two-year technical college education and the associate degree. A two-year technical college is defined as a public, community based, associate degree granting postsecondary institution. The definition of technical education is limited to the associate degree level curriculum the content of which is designed to prepare individuals for entry level positions in technology areas, e.g., manufacturing technology, business administration, computer information systems, transportation technologies, health technologies, design technologies, etc. Associate degree technical education is differentiated from vocational education in the sense that it is broader in its make-up. Where vocational education concerns itself with narrow preparation for a job, technical education is

broader in that it prepares individuals for the several jobs which may exist within a broad technology area.

The general education component of the curriculum is defined as that portion of the curriculum which is not directly related to the technology and which incorporates those areas of study that help shape the whole person as Maritain put it (Gallagher & Gallagher, 1962). Throughout this presentation, general education and liberal education will be used synonymously.

Before we go on, let me tell you a little bit about the four individuals I mentioned earlier. Jacques Maritain was a French educator and philosopher who lived from 1882 to 1973. He lectured on scholasticism in Europe and America and taught at such universities as Toronto, Chicago, Columbia, Notre Dame. According to Maritain, the primary aim of education in the broadest sense is to form the whole, complete person. According to Maritain, education directed toward wisdom, centered on humanities, aiming to develop in people the capacity to think correctly and to enjoy truth and beauty, is education for freedom, or liberal education. Whatever his vocation may be, and whatever special training his vocation may require, every human being is entitled to receive such a properly human and humanistic education.

Alfred North Whitehead was an English mathematician and philosopher who lived from 1861 to 1947. Whitehead taught at Cambridge, London University, and Harvard. In his book, The Aims of Education and Other Essays, Whitehead has some very specific things to say regarding education.

John A. Dillon Jr. is professor emeritus of physics at the University of Louisville and a well known and respected systems scientist.

Gladys M. Busch is a professor of education at Spalding University in Louisville, Kentucky, and a sociologist. She and her husband, John A. Busch, also a sociologist, have written two books which are important to the content of this presentation. The books are Sociocybernetics: A Perspective for Living in Complexity and Human Societies at the Crossroads: An Introduction to Macrosociology.

II. A HISTORICAL PERSPECTIVE

According to Maritain (Gallagher & Gallagher, 1962), education is not an autonomous science, but one dependent upon Philosophy. Throughout the course of history, varying philosophical currents have produced varying approaches to education. If one examines closely the state of education and the professed thinking of the employing community in our country today, one can easily detect a philosophical flux. The current philosophy can be described as one of enlightenment in terms of how employers view employees and the production process. It appears that those in control of capital and the means of production are seeking a better educated, more adaptive, more thinking participant in the production process. Such enlightenment on the part of employers surely deserves a concurrent enlightenment in terms of how those employees are educated. As Whitehead (1929) suggested, ". . . work should be transfused with intellectual and moral vision and thereby turned into a joy, triumphing over its weariness and its pain." (p. 44, 1929) This appears to call for a person educated beyond the realm of vocational or technical skills. In other words, a person might benefit from a stronger general education. Whitehead's suggestion that

technical education cannot be adequate if it is not liberal is as appropriate today as it was when it was written in 1929.

Contrast this thinking to other periods of man's history. From the time of the ancient Greeks, a distinction between vocational and liberal education has been debated (Gutek, 1972). When Athens became a commercial center, the sophists emerged as the group which provided the "practical" instruction to the new rich which they needed in order to consolidate economic, social and political power. However, the sophists' views were not shared by Plato, Aristotle and others.

During the later middle ages, when city life revived at the expense of agrarianism which had sustained feudalism, the craft guild was established. One can trace today's vocational education lineage back to the middle ages. It was at this time that the three stages of guild education, apprentice, journeyman, and master craftsman, were established. This terminology is prevalent yet today (Gutek, 1972). It was also during this time that the medieval universities were established. The curriculum of the universities consisted of the core liberal arts and sciences which were considered to be foundational to professional studies of theology, law and medicine (Gutek, 1972). A distinct separation existed between the two types of education.

The Renaissance was a transition period which saw the seeds of the European dual system of educational institutions--the classical schools and the vernacular schools--planted. The humanist educators of this period virtually ignored the scientific and practical studies. The Reformation extended educational opportunities while at the same time it solidified the dual-track system of formal schools (Gutek, 1972).

The distinction between vocational education and liberal education continued into the 19th and 20th centuries. In America this distinction was heightened with the passage of the Smith-Hughes Vocational Education Act in 1917.

While there has been fairly consistent consideration of preparing individuals for the workforce throughout history, that preparation has been a rather isolated one in terms of shaping the whole person.

III. THE CASE FOR STRENGTHENING GENERAL EDUCATION

Those of us involved in two-year technical education need to address two fundamental questions. The first concerns how best to instill in our students those non-technical skills and knowledge that employers acknowledge as being critical to productivity and competitiveness. The second concerns the limitations of the associate degree in terms of its length.

Whitehead (1929) stated that ". . .education is a difficult problem, to be solved by no one simple formula." (p. 36, 1929). In my view, one way, and there are surely many others, of addressing the first question is through the liberal arts. Much of my thinking and views formulated over the last few years have been focused and confirmed through reading Maritain and Whitehead.

Maritain (1943) wrote that "man is not merely an animal of nature . . ." but ". . .an animal of culture, whose race can subsist only within the development of society and civilization . . ." (p. 2, 1943). In other words, man's life does not revolve exclusively around his work. According to Maritain (1943), the aim of education is to guide man in shaping himself as a human person. That shaping process includes

acquiring knowledge, strength of judgment, and moral virtues within the context of a spiritual heritage of the nation, civilization, and culture in which he lives.

At the same time, Maritain does not suggest that the utilitarian aspect of education be neglected. Most people do have to have a means of providing a living for themselves. However, according to Maritain (1943), ". . . this practical aim is best provided by the general human capacities developed." (p. 10, 1943). The basic idea is that man can only enjoy a full life, i.e., happiness in work, in culture, in religion, in society, if he can conquer internal and spiritual freedom. For true happiness, man must be liberated through knowledge and wisdom, good will, and love. The best route to these ends is through a liberal education (Maritain, 1943).

Another thing that is important to consider at this point is that a liberal education should be had by all. It should not be limited to only the brightest. Again, the purpose of a liberal education is to liberate one's creative energies and intuitive powers. Every person, to the extent of his ability, can achieve a certain level of such liberation. (Gallagher & Gallagher, 1962).

In 1929 Whitehead wrote

> The immediate need of the nation is a large supply of skilled workmen, of men with inventive genius, and of employers alert in the development of new ideas (p. 44, 1929).

The message contained in these words is comparable to that contained in the opening remarks of this presentation. Whitehead posited that such workmen and employers will only meet the stated requirements if they enjoy their work. Further, such joy can come only through liberal education. He states

> . . . that alike for masters and for men a technical or technological education, which is to have any chance of satisfying the practical needs of the nation, must be conceived in a liberal spirit as a real intellectual enlightenment in regard to principles applied and services rendered. In such an education geometry and poetry are as essential as turning laths. (p. 45, 1929).

Whitehead (1929) asserted that technical education cannot be adequate if it is not liberal. When a student completes a segment of his education, he must know something well and be able to do something well.

IV. SOCIAL STRUCTURES AND SYSTEMS THEORY

With these views of Maritain and Whitehead in mind, and with what we know to be happening in our post-industrial society, I would now like to take a closer look at societal structure and systems theory. Busch (1992) posited first of all that we are in the midst of an evolution to a new form of social organization. This evolution is being propelled by technology. These changes, brought on by this technology driven evolution, will substantively alter the social structures of our society which in turn ultimately alter our culture. This happens because technology greatly influences what we think. However, the phenomenon of cultural lag as described by Ogburn complicates the evolutionary process. According to Ogburn, cultural lag occurs when developing new ways of thinking take a while after the introduction of new technology. This phenomenon creates anxiety and stress.

We can see such structural changes occurring in our society as witnessed by the downsizing of such companies as IBM, Sears, GM, etc. We can see those changes in the decreasing demand for unskilled labor, the shift from manufacturing to service, the unrest in our cities, the

increased tensions between ethnic groups, and the influx of large numbers of women into the workforce. To be effective in terms of addressing these societal structural changes, our curriculum must be inextricably linked to the dynamics of our society. To ignore this fact is to doom our students.

As educators we must give our students a competitive edge by preparing them to deal with this anxiety and stress. One way to do that is to help them develop the perspective necessary to overcome the anxiety and stress. If we do not provide them with this perspective, through a liberal education, they are more likely to search for the quick fix, the simplistic fix, which in the long run adversely affects production, society, and the individual.

To help our students gain that competitive edge, we should look at our curriculum as a system, an open system. An open system is one which interacts with its environment by taking in from its environment matter, energy, and information. It takes these elements, rearranges and processes them, and uses the products to carry on its basic funtions. An open system is characterized by order and complex relationships among its parts. (Dillon 1992)

We can view our curriculum in one of two ways. We can view it simply as an aggregate, i.e., a set of parts, the whole of which is equal to the sum of its parts. Or, we can view our curriculum as a system, i.e., a set of parts in relationship. Because there is a relationship between and among the parts of a system, its whole is greater than the sum of its parts. In other words, we can give our students that competitive edge, by developing and delivering our curriculum as a system, not as an aggregate of individual courses and experiences. We

can strengthen our curriculum by building relationships between the liberal arts and the technical, by breaking that age old separation between the two.

But in practical terms, what can a liberal education contribute to those pursuing a technical education. The National Council for Occupational Education and the Community College Humanities Association, both affiliate organizations of the American Association of Community Colleges, have taken a leadership role in promoting the liberalizing of the curriculum. In their joint publication, Successfully Integrating the Humanities into Associate Degree Occupational Programs (1991), ten unique and significant contributions of the humanities are cited (1991).

1. An appreciation for what is significant about human life--past, present, and projections for the future.

2. The ability to understand and empathize with others through the development of an understanding of human needs and problems.

3. An understanding beyond proficiency in basic language skills of the unavoidable ambiguities, vagaries, and value-laden natures of human language.

4. The ability to recognize the limits and goals in applying analytical skills to the resolution of human problems and dilemmas.

5. An appreciation of the variety of human purposes and values to be realized in solving problems.

6. The ability to approach and make decisions concerning problems that may not have a singular resolution.

7. An appreciation of the importance of responding to change as an essential and necessary human activity.

8. The ability to make judgments reflective of human values: ethical, aesthetic, and pragmatic.

9. An appreciation of what human beings hold in common which encourages their sense of civic purpose and responsible citizenship.

10. An appreciation of the values of diverse cultures.

These contributions relate directly to the professed needs of employers and correlate with the thinking of both Maritain and Whitehead.

The second question concerns the time limitations of the associate degree. On the surface, it appears that a 60 to 66 credit hour framework is insufficient to support incorporation of both a sufficient level of technical content and liberal arts content. If one looks at the curriculum in the traditional way, that assumption is correct. The technical education associate degree must be totally revamped, from its philosophical core to its structure. In the past the curriculum has been very structured and rather narrow in its focus. It has been more attuned to training for very specific occupations rather than educating for careers in broad technologies and full participation in life. This is the first thing that must change.

Traditionally, the liberal arts in the associate degree curriculum have served two fundamental roles (Cohen & Brawer, 1987). The first is in support of the university transfer function. In this case, the liberal arts curriculum has been conceived and implemented as introductory or survey in content and form. Its sole purpose is to prepare students to meet university transfer requirements.

The second role is in support of occupational education. The arts and sciences have and continue to perform three functions in this role. The first is the application of concepts from arts and science disciplines to specific occupational situations. Examples include Mathematics for Business and Technical Writing. The second function has been the

development of occupational courses built on concepts taken from branches of the arts and science discipline. Examples include courses in business ethics, medical ethics, and logic. The third function has produced an occupational grouping that has emerged from entire sets of courses from an arts and science discipline. Examples include programs in agriculture, natural resources, and administration of justice.

Although the support of occupational education by the liberal arts over time has been important, it still falls short of the ideal of education posited by Whitehead that technical education should be liberal and a liberal education should be technical. The technical associate degree curriculum has always been developed beginning with the technical content--the specific technical skills and knowledge--needed to become employable. If room (credit hours) was available after the technical content was constructed, then such secondary content as mathematics, science, language skills, communication skills, etc. were added into the curriculum to fill the credit hour requirements.

In structuring the "new" technical associate degree, curriculum developers should begin by defining and prioritizing all expected student outcomes, technical as well as non-technical. If one buys into the philosophy described in this presentation and supported by the thinking and writings of Maritain, Whitehead, and Busch, the skills and knowledge that employers say they want and which are best addressed through the liberal arts (general education) will rise to the top of the priority list. The liberal arts then become prime; they become the core of the curriculum around which the technical education content is built and integrated.

V. CONCLUSION

Technical educators face a dilemma. On the one hand, employers demand employees who understand the business or industry in which they work, who understand the economy in which they work and live, who have the foundation for continued learning and personal development, who have a grasp of the basic academic skills, who understand and are capable of working with others, and who are capable of thinking critically. In other words, much of what employers require in today's workforce is rooted in the liberal arts and in broad technology concepts as opposed to specific, hands-on, job training.

On the other hand, technical educators are saddled with a curriculum which by its very design is unresponsive to the needs of employers and of society in general. It is a curriculum design that recognizes and perpetuates the distinction between technical and liberal education, not the blending of the two. It is a curriculum design which has over the years emphasized technical content to the detriment of the arts and sciences. It is a curriculum design which is not providing students with the kinds of skills and knowledge that employers require.

A new approach to curriculum design and development is needed. Curriculum content should be structured in support of well defined outcomes. I submit to you that those outcomes currently defined in the literature can best be met through a strong liberal arts centered curriculum. Let me describe one such approach which involves a three step process.

In designing associate degree programs (Heckman, 1991), faculty should first develop a general education core curriculum designed to provide each student the opportunity to

*Increase proficiency in critical and creative thinking, learning to learn, problem solving, personal management and development, interpersonal skills, organizational skills, and leadership skills.

*Increase understanding of the global economy so that he/she may more effectively participate in that economy.

*Increase understanding of the physical world in which he/she must live, work, and play.

*Increase understanding of culture and society in general so that he/she may more effectively participate in that society.

*Increase understanding of mathematical methods and concepts, their assumptions, and implications.

*Increase capability for written and oral communications and listening.

Once the general education core is developed, the technical curriculum should then be constructed. In doing so, the faculty should strive to develop content to provide each student the opportunity to

*Increase proficiency in critical and creative thinking, learning to learn, problem solving, personal management and development, interpersonal skills, organizational skills, and leadership skills.

*Gain a general knowledge of and an increased functional proficiency in the various aspects of the business (industrial, service, etc.) environment in the technology area chosen.

*Gain an understanding of and proficiency in the technical content common to all specialties within a technology degree program.

*Develop proficiency with the "tools of the trade" common to all specialities within a technology degree program.

*Gain the proficiency needed in mathematics, science, and communications to successfully complete his/her technical education and to continue learning beyond degree completion.

The third step in this process is a critical one, for it is the mechanism through which this system is integrated. The third step is

Instructional Design. We must become experts in learning theory. There is much that can be learned from the latest research in cognitive psychology. As educators we need to create instructional designs which (1) are student centered, (2) are outcomes based, (3) address declarative and procedural knowledge within an applied context, and (4) enable students to develop the physical and conceptual tools necessary to link declarative and procedural knowledge.

Busch (1992) asserted that

> History has taught us that under the right circumstances, humans will believe just about anything. Among those right circumstances are lack of training in critical thinking and lack of general education. . .what the widely educated person attains that is less likely to be present in others is a background, or pattern, that is widely encompassing. It is a pattern that keeps on asserting itself when one is tempted to find simplistic explanations of life's problems. (pp. 234-235)

As technical educators, we should develop and deliver a curriculum which provides our students with an organizing perspective as described by Busch (1992) that ". . . facilitates the integration of disciplinary knowledge."

Regardless of the approach, it is evident to me that general education, the liberal arts, must achieve a higher profile in the development of technical education curriculum. The technical education curriculum that focuses only on specific technical skills does not prepare the individual to grow and to adapt to new technologies. Narrowly focused education and training is really education and training for obsolescence. Such curriculum fails the person not only in terms of preparing the person for continued, rewarding employment opportunities, but it also fails the person in terms of helping the person form himself or herself as a human being. Such forming is necessary to a fulfilling life

which is not only personally rewarding but also a life which contributes to the well being of one's nation, community and culture.

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